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**Working Party on Pollution and Energy**

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**Light vehicles – Global Technical Regulations Nos. 15 (Worldwide harmonized Light vehicles Test Procedures (WLTP)) and 19 (Evaporative emission test procedure for the Worldwide harmonized Light vehicle Test Procedure (WLTP EVAP))**

# Proposal for the technical report on the development of Amendment 4 to global technical regulation No. 15 (Worldwide harmonized Light vehicles Test Procedures (WLTP))

## Submitted by the Informal Working Group on Worldwide harmonized Light vehicles Test Procedure (WLTP)*

The text reproduced below was prepared by the Informal Working Group (IWG) on Worldwide harmonized Light vehicles Test Procedure (WLTP). This is the technical report submitted together with the proposal for Amendment 4 to global technical regulation No. 15 on WLTP (ECE/TRANS/WP.29/GRPE/2018/2).

* In accordance with the programme of work of the Inland Transport Committee for 2014–2018 (ECE/TRANS/240, para. 105 and ECE/TRANS/2014/26, programme activity 02.4), the World Forum will develop, harmonize and update Regulations in order to enhance the performance of vehicles. The present document is submitted in conformity with that mandate.

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# Technical report on the development of Amendment 4 to global technical regulation No. 15 on Worldwide harmonized Light vehicles Test Procedures (WLTP)

## I. Mandate

1. Amendment 4 to UN global technical regulation (GTR) No. 15 was developed by the Informal Working Group (IWG) on Worldwide harmonized Light vehicles Test Procedures (WLTP) in the framework of Phase 2 of the development of GTR No. 15. The Executive Committee (AC.3) of the 1998 Agreement adopted the authorisation to develop Phase 2 of GTR No. 15 at its June 2016 session (ECE/TRANS/WP.29/AC.3/44).

## II. Objectives

2. To introduce definitions of response time, delay time and rise time harmonized with those in GTR Nos. 4 (heavy-duty engine emissions) and 11 (non-road compression ignition engine emissions).

3. To introduce improvements to the gear shifting procedures. $n_{rated}$ is now defined as the rated engine speed declared by the manufacturer as the engine speed at which the engine develops its maximum power. Experts approved to limit $n_{min_drive_up/down}$ to twice $n_{min_drive_set}$ whereas the current regulation allows the manufacturer to use higher $n_{min_drive}$ values without any limitation.

Furthermore, since the duration of the cold start phase is engine and vehicle design dependent, it was agreed that a manufacturer should have the possibility to specify the time span and the $n_{min_drive}$ value individually within the low phase of the cycle.

However, the time span should be specified such that it ends in a stop phase so that there is no change of $n_{min_drive}$ within a short trip.

4. To introduce consistency in the use of the terms accuracy, precision, resolution, tolerance, repeatability and deviation.

5. To introduce bi-fuel and bi-fuel gas vehicles keeping in line with Regulation No. 83. Definitions and a new Appendix (Annex 6, Appendix 3, Calculation of gas energy ratio for gaseous fuels (Liquefied Petroleum Gas and Natural Gas/biomethane)) were incorporated into the GTR.

6. To introduce the appropriate positioning of payload mass (25 kg plus the mass of vehicle load) has until now not been clearly defined. Additional masses for setting the test mass shall be applied such that the weight distribution of that vehicle is approximately the same as that of the vehicle with its mass in running order. In case of category 2 vehicles or passenger vehicles derived from category 2 vehicles, the additional masses should be located in a representative manner and shall be justified to the responsible authority upon their request. The weight distribution of the vehicle shall be recorded and shall be used for any subsequent road load determination testing.

7. To correct terminology such as "classes of rolling resistance coefficients". Tables relating to energy efficiency classes according to rolling resistance coefficients for tyres have been modified accordingly.

8. To correct minor spelling and/or punctuation mistakes, and restructuring some paragraphs. To keep writing and formatting consistently within the GTR.

9. To correct some equations and to make them all consistent with Word's use of mathematical symbols.

10. To exclude all Rechargeable Electric Energy Storage Systems (REESSs) that do not contribute to vehicle propulsion from monitoring.

11. To better define the purity of certain gases such as nitrogen and synthetic air.

12. To define more specifically the difference in mass of $CO_2$ during charge sustaining between the test with the highest and lowest positive and negative electric energy charge.

## III. Meetings held by Task Forces

13. The proposed changes in Amendment 4 to GTR No. 15 listed in section II above were discussed at length and agreed upon by all participants during the following Task Force (TF) face-to-face or audio/web meetings:

(a) The nineteenth IWG meeting in June 2017 in Geneva;

(b) Dynamometer TF (once), New Issues TF (once), EV TF (3 times). Two audio/webs on Movable Aerodynamic Body Parts (MABPs) were held but there is not yet a finalized text.